



INTEGRITY
PRODUCTS

INTEGRITY-PRODUCTS.COM

COLD INSULATION

PRODUCT APPLICATIONS



The page features a large, abstract geometric design on the left side, composed of overlapping brown and white shapes. In the bottom-left corner, there is a photograph of an industrial facility at night, showing a complex network of pipes, valves, and bright yellow lights. The main content area is white and contains the table of contents text.

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Technical Data Sheet

Installation Guidelines

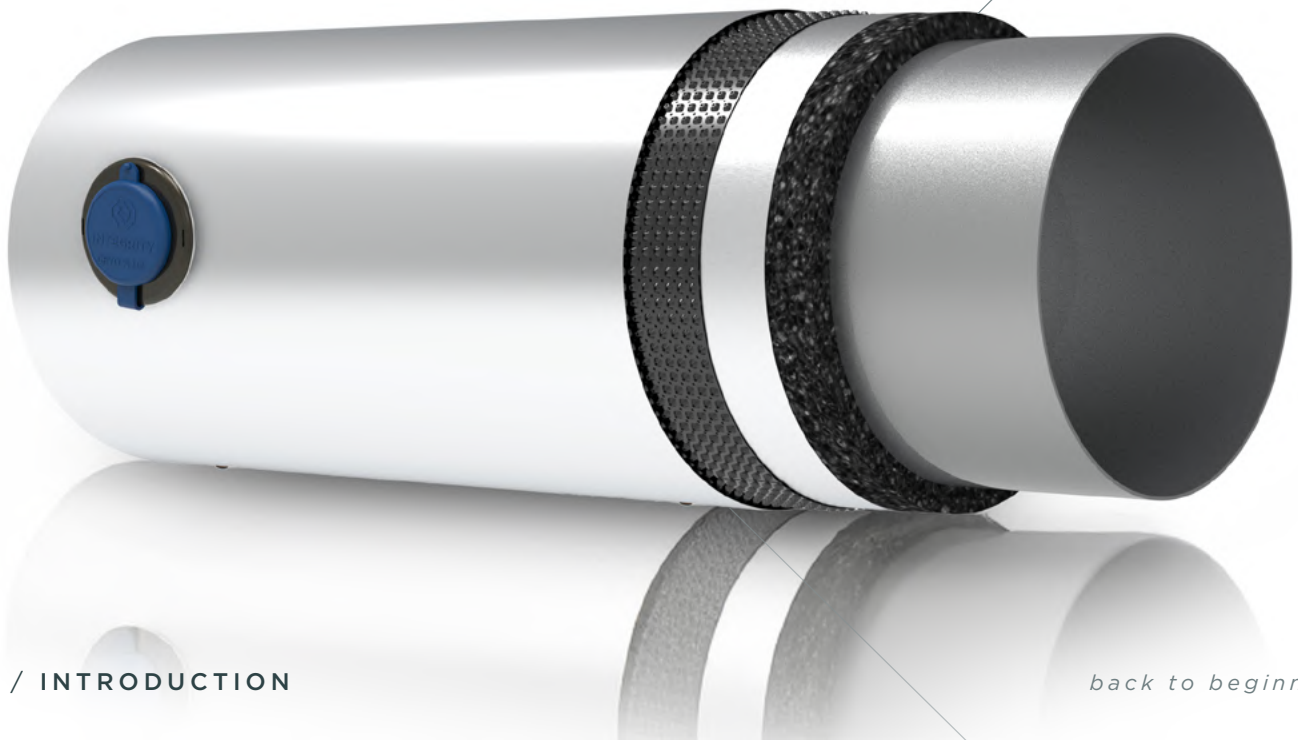
COLD INSULATION PRODUCT APPLICATIONS

Integrity Products PVC Dimple Wrap serves as a durable and protective outer layer within multilayered cryogenic insulation systems, providing both mechanical protection and superior moisture management. The raised dimpled design creates an effective air gap that promotes drainage and prevents moisture accumulation, and maintaining thermal performance.

When used in combination with the Integrity Drain Plug, accumulated water or condensate can be efficiently released from the insulation system, ensuring optimal long-term protection. Additionally, integrating the Integrity Cryo Inspection Port allows for convenient, non-invasive access to the insulation system for periodic inspection and maintenance. Together,

these components form a comprehensive solution for protecting cryogenic systems from environmental and operational challenges while extending service life and reliability.

In accordance with industry best practices, finishing details for piping, piping insulation, and single-layer insulation applications should be referenced from the CINI Manual for Insulation. The CINI guidelines provide standardized specifications and detailed procedures for the proper installation, finishing, and sealing of insulation systems, ensuring consistency, safety, and performance across cryogenic applications.



KEY FEATURES

Durable Outer Protection

The PVC Dimple Wrap (PDW) provides a tough, flexible barrier that shields the cryogenic insulation system from mechanical damage and environmental exposure. During installation of cladding and related details over vapor barriers, the PDW forms a uniform space and tough protective layer—reducing the risk of punctures and tears from sharp cladding edges, screws, or blind rivets.

Enhanced Moisture and Vapour Barrier Protection

Once in service, the PVC acts as an additional vapour barrier abrasion protection layer, helping preserve the integrity and longevity of the system.

Increased Cladding Strength and Impact Resistance

The PVC improves cladding rigidity by adding up to 35 PSI of additional resistance, protecting against buckling, dents, and other damage caused by mechanical impact, foot traffic, or falling ice.

Thermal Efficiency Benefits

The uniform air gap created by the PDW provides a secondary thermal buffer, reducing heat gain from ambient conditions. This air space helps absorb normal temperature fluctuations of the cladding, minimizing their effect on the cryogenic system.

Integrated Water Drainage

The Integrity Drain Plug allows controlled removal of trapped moisture or condensate, maintaining long-term insulation efficiency and system reliability.

Easy Inspection Access

The Integrity Cryo Inspection Port enables quick, non-invasive access for inspection and maintenance, and ensuring continued protection of the vapour barrier.

Products that Enhance a Complete System Solution Approach

Together, these Integrity Products components provide a comprehensive approach to cryogenic insulation protection, maintenance, and longevity.

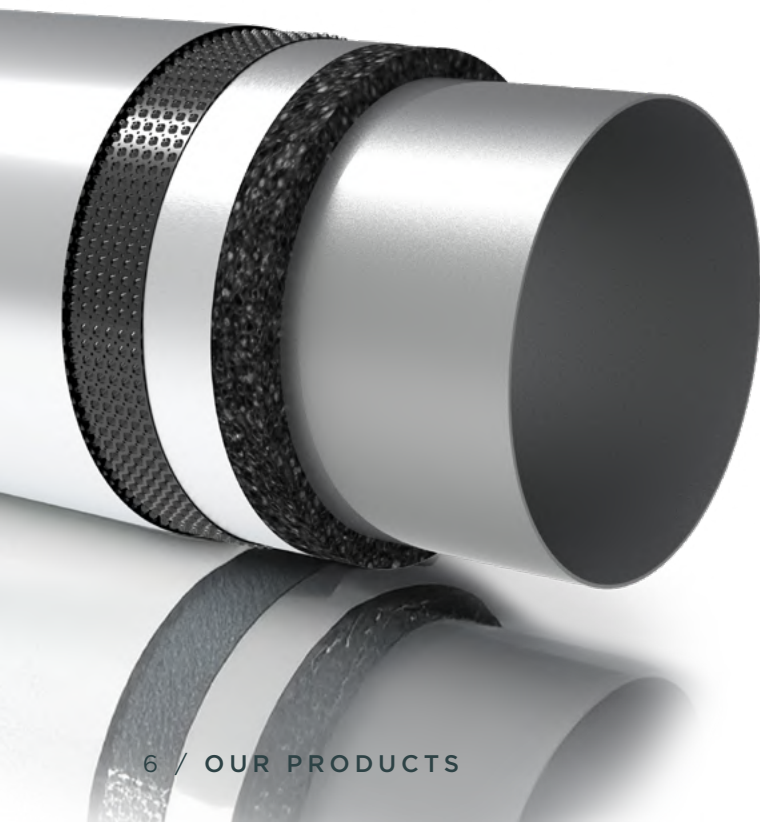
OUR PRODUCTS

ENGINEERED TO PERFORM IN THE COLDEST CONDITIONS

INTEGRITY PERFORATED DIMPLE WRAP (PVC)

Integrity Products' Perforated Dimple Wrap (PVC) is engineered to create a uniform 6 mm air gap between the insulation system and the outer metal cladding. This high-quality Polyvinyl Chloride (PVC) material is designed for flexibility, durability, and mechanical strength, helping to protect both the insulation and cladding from physical damage.

Its precision-engineered perforations and raised dimple structure promote efficient vapour release and moisture drainage. Any trapped moisture within the insulation is directed into the air gap, allowing it to migrate to the 6 o'clock position where it safely exits the system through the drains.



INTEGRITY PERFORATED DIMPLE WRAP

INTEGRITY DRAIN PLUG

INTEGRITY CRYOPLUG

INTEGRITY DRAIN PLUG

The Integrity Drain Plug is a precision-engineered drainage component designed to enhance the performance and longevity of cold insulation systems. Installed in conjunction with metal jacketing and caulking or sealant systems, it provides a controlled outlet for the removal of water or condensate that may infiltrate the insulation.

Manufactured from flame-resistant, non-combustible Polyphenylene Sulfide (PPS) Black, the Integrity Drain Plug offers excellent chemical resistance, mechanical strength, and thermal stability, ensuring reliability in demanding industrial environments. By allowing trapped moisture to drain freely, it prevents water accumulation at the lowest point of the system (typically the 6 o'clock position), helping maintain insulation integrity, and extend overall system service life.





INTEGRITY CRYO PLUG

Integrity Products Cryogenics Plugs are engineered specifically for cold service and cryogenic insulation systems, providing a reliable and reusable access point for inspection and maintenance of insulated piping. Designed as a simple three-part assembly, the Cryogenics Plug ensures a secure, vapor-tight seal while maintaining the thermal integrity of the system.

The first component consists of the plug body with an aluminum mounting ring featuring inserts for banding applications, ensuring stable installation. The second component is an insulation insert made from closed-cell foam with a PTFE (Teflon) strap, mechanically mounted to deliver a precise, pressure-retained fit. The third component is a PTFE sleeve, which can be cut to match insulation thickness. This sleeve prevents air infiltration beneath the insulation and acts as a barrier for the foam insert, creating a suction-type fit. A thermal break is designed at the base of the sleeve to contour around the pipe's outer diameter, reducing conductive heat transfer and maintaining the system's overall efficiency.





COMPLETE CRYOGENIC INSULATION PROTECTION SYSTEM

Together, Integrity Products' PVC Dimple Wrap, Drain Plug, and Cryogenics Plug form a complete cryogenic insulation protection system. The PVC Dimple Wrap safeguards against mechanical damage and moisture intrusion, the Drain Plug ensures effective moisture removal, and the Cryogenics Plug provides secure access for inspection and maintenance. Combined, they enhance system performance, reduce corrosion risk, and extend service life in demanding cold service environments, all in alignment with CINI insulation standards.

INTEGRITY PERFORATED DIMPLE WRAP

Safeguard against mechanical damage and moisture intrusion.

INTEGRITY DRAINPLUG

Effective moisture removal

INTEGRITY CRYPLUG

Secure access for inspection and maintenance

PERFORATED (PVC) DIMPLE WRAP™

COLD APPLICATIONS patented

PRODUCT DESCRIPTION

Integrity's PVC Perforated Dimple Wrap™ is engineered to maintain a consistent 6 mm air gap between insulation and metal cladding. When paired with our vents and drains, this creates the comprehensive Integrity Products' Insulation Ventilation System (IVS). Made from high-quality, flexible, and durable Polyvinyl Chloride (PVC), the wrap offers robust protection for both insulation and cladding against mechanical damage. Its unique perforations and raised dimples facilitate moisture and vapor movement, allowing trapped moisture to migrate into the air gap, drain to the 6 o'clock position, and exit through the drain system.

PRODUCT APPLICATION

Integrity's PVC Perforated Dimpled Wrap™ is designed to extend the service life of insulation and piping systems. Installed with the dimpled side facing outward, it fully surrounds the insulation, providing added protection. Suitable for all insulation types, pipe sizes, and both hot and cold applications, it helps prevent moisture buildup. After installation, the insulation and outer cladding is applied as usual, keeping in mind that the wrap adds 0.5 in. (12 mm) to the insulation's outer diameter. This product can be used in new insulation systems to prevent moisture accumulation or retrofitted onto damaged or saturated insulation to aid in drying.

INSTALLATION

Integrity's PVC Perforated Dimple Wrap™ is supplied in rolls of 3 ft × 50 ft (0.91 m X 15.2 m). To install, place the wrap over the insulation with the dimpled side facing outward, then secure it in place banding, or tape. The insulation and metal cladding is then applied over the PVC Perforated Dimple Wrap™ and installed as usual.

Note: The metal cladding should be oversized by 0.5 in (12 mm) to accommodate the additional outer diameter created by the PVC Perforated Dimple Wrap™. For complete details refer to the separate Installation Instructions.

MATERIAL SPECIFICATIONS

MATERIAL(S)

Polyvinyl Chloride (PVC)

COLOUR

Black

DENSITY

1.4 g/cm³

TENSILE STRENGTH

35 ~ 56 MPa

COMPRESSIVE STRENGTH

39 PSI

ELONGATION

2 ~ 40%

SHRINKAGE

1.25%

UV RESISTANCE

Excellent

FLAME RESISTANCE

Excellent

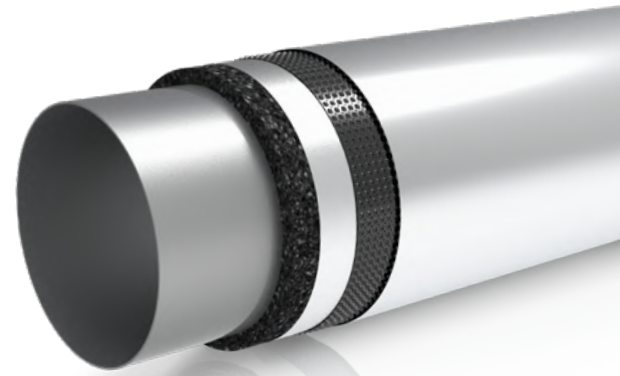
WORKING TEMPERATURE

-40°F to 194°F (-40°C to 90°C)

MELTING POINT

414°F (212°C)

PERFORATED (PVC) DIMPLE WRAP™ COLD APPLICATIONS patented



TOOLS REQUIRED



TIN SNIPS



SILICONE
SEALANT

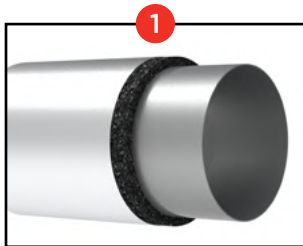


TAPE



SCREWS

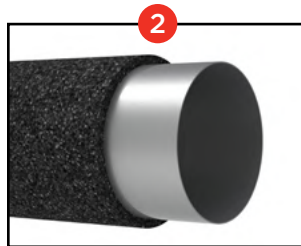
Always wear appropriate PPE (personal protective equipment) which conforms to applicable work safe standards.



STEP 1

For Existing Systems:

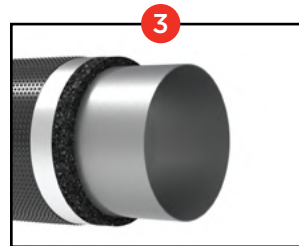
Before removal, label all existing jacketing, bands, and fittings for traceability. Carefully remove jacketing, bands, sealants, and fasteners without damaging the insulation or vapor barrier. Inspect exposed areas for damage, moisture intrusion, or CUI, and repair or replace as required.



STEP 2

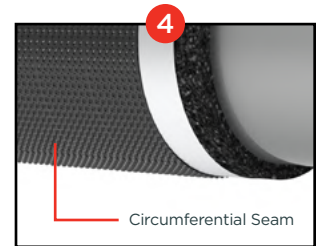
Next Step for Existing Systems or For New Installation Systems:

Install insulation and vapor barrier materials in full compliance with the approved material specifications, project requirements, and applicable regulatory standards.



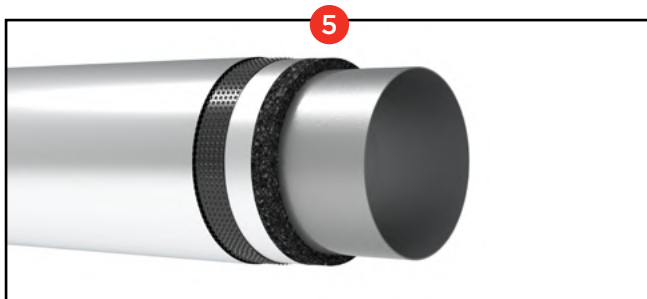
STEP 3

Visually inspect the external surface of the vapor barrier for any signs of mechanical damage. Install the perforated dimple sheets by wrapping them around the vapor barrier, maintaining either a butt seam or an overlap at the longitudinal joint. Secure the dimple sheets around the vapor barrier using approved tape to ensure a tight and uniform fit.



STEP 4

Install adjacent dimple wrap sections in the same manner as Step 3, ensuring circumferential seams are aligned but not overlapped.



STEP 5

Install new metal jacketing, or reinstall existing jacketing where suitable, and secure in place using approved banding and mechanical fasteners (see Notes 1 and 2).



Note 1: Existing jacketing may be reused only if it provides sufficient length and coverage to accommodate the increased system circumference after installation.

Note 2: When using mechanical fasteners, ensure all screws are installed between the PVC dimples to avoid compromising the integrity of the dimple wrap layer.

INTEGRITY DRAIN PLUG™

patented

PRODUCT DESCRIPTION

Integrity's Drain Plug™, designed for use with metal jacketing and sealants, provides enhanced protection by allowing trapped moisture to escape. Made from flame-resistant, non-combustible Polyphenylene Sulfide (PPS), these highly durable drain plugs ensure efficient drainage, preventing water accumulation within the insulation system and significantly reducing the risk of corrosion.

PRODUCT APPLICATION

Installing Integrity's Drain Plugs™ at regular intervals ensures optimal protection for piping and equipment. For effective moisture drainage, Drain Plugs should be placed at maximum 3-meter intervals at the lowest points of insulated vessels and bends, as well as at every insulation stop.

Engineered for versatility and ease of installation, Integrity's Drain Plugs™ are adjustable to accommodate various insulation thicknesses, providing superior protection against moisture buildup and corrosion.

PRODUCT SIZES

The Drain Plug can be adjusted to suit the insulation thickness by breaking or cutting the Drain Plug to the required length.

INSTALLATION OVERVIEW

1. Cut/drill a 3/4 in (19 mm) hole at the desired location in cladding using tin snips or a hole saw ensure the hole saw only penetrates the cladding.
2. Adjust the length of the Drain Plug by breaking or cutting the Drain Plug from the open end to closely match the gap between the cladding and the vapour barrier.
3. Install rubber grommet into the cutout hole in the cladding.
4. Insert Drain Plug into rubber grommet push fully into place



MATERIAL SPECIFICATIONS

MATERIAL(S)
Polyphenylene Sulfide Black (PPS)
COLOUR
Black
WALL THICKNESS
0.75 mm
LENGTH
152.4 mm
DIAMETER
17 mm
WEATHER RESISTANCE
Excellent
UV RESISTANCE
Excellent
CHEMICAL RESISTANCE
Excellent
TENSILE STRENGTH
MPA 140 Parameter
MAXIMUM OPERATING TEMP.
250°C 482°F
NOTCHED IMPACT STRENGTH
9.5kJ/m²



INTEGRITY CRYOGENIC PLUG™

patented

PRODUCT DESCRIPTION

Integrity's Cryogenic Plugs™ are specifically engineered for cold service applications, offering a simple yet effective three-part assembly for insulated piping systems.

- 1. Plug Assembly:** The primary component features a durable plug with an integrated aluminum ring and inserts, designed for secure banding applications.
- 2. Insulation Insert:** Made from closed-cell foam, this insert includes a mechanically mounted PTFE strap for enhanced stability.
- 3. PTFE Sleeve:** Customizable to insulation thickness, this sleeve prevents air infiltration, acts as a barrier for the foam pillow, and creates a suction-like fit. Additionally, a thermal break at the base of the sleeve curves around the pipe's outer diameter, minimizing heat transfer.

Designed for maximum efficiency and protection, Integrity's Cryogenic Plugs™ ensure superior insulation performance in extreme cold environments.

PRODUCT APPLICATION

Integrity's Cryogenic Plugs™ are specially engineered for cryogenic applications, providing secure, repeated access for non-destructive testing (NDT) on insulated pipes, vessels, tanks, and equipment.

Crafted from advanced materials specifically designed to withstand fluctuating and sub-zero temperatures, these inspection ports ensure durability and performance in extreme conditions. Their innovative design creates a reliable vapor and moisture barrier, significantly reducing the risk of frost and ice buildup on insulated systems.

For superior protection and efficiency in cryogenic environments, Integrity's Cryogenic Plugs™ deliver unmatched reliability.

MATERIAL SPECIFICATIONS

PLUG

MATERIAL(S)

Cover, Cap, and Edge trim:
60 Durometer Silicone
Edge Trim (inside): 18 Gauge Mild Steel

TENSILE STRENGTH

1319 PSI (9.1 MPa)

ELONGATION

234%

PTFE PULL STRAP

TENSILE STRENGTH

3,336 PSI (23 MPa)

DENSITY

0.0781 lb/ft³ (2.16 g/cm³)

ELONGATION

220%

REMOVE CLOSED CELL FOAM

MATERIAL(S)

23 MPa

DENSITY

2.16 g/cm³

PTFE SLEEVE

TENSILE STRENGTH

3,336 PSI (23 MPa)

DENSITY

0.0787 lb/ft³ (2.18 g/cm³)

ELONGATION

280%

INTEGRITY CRYOGENIC PLUG™

patented

TOOLS REQUIRED



TIN SNIPS

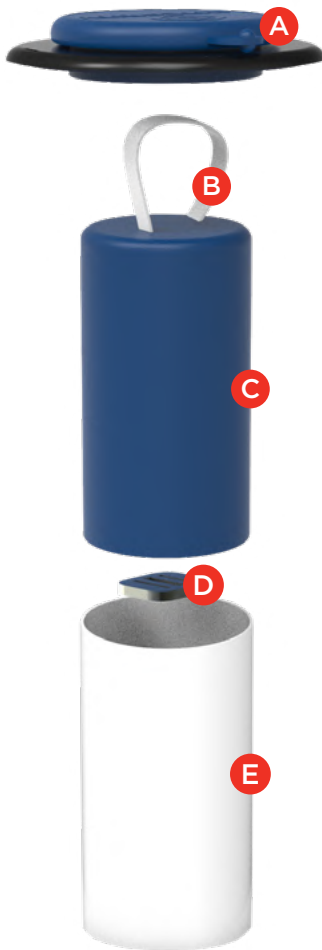


KEY-HOLE
SAW

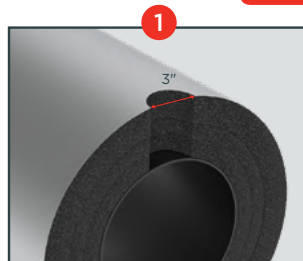


SILICONE
SEALANT

Always wear appropriate PPE (personal protective equipment) which conforms to applicable work safe standards.

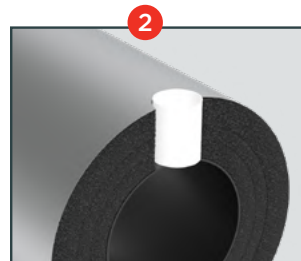


- A Plug
- B PTFE Pull Strap
- C Closed Cell Foam
- D PTFE Strap Clip
- E PTFE Sleeve



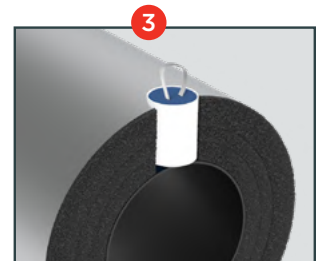
STEP 1

Mark a 3" circle on the jacketing and cut the jacketing using tin snip and core-out insulation using key-hole saw. See the cross-section of the cavity created by coring.



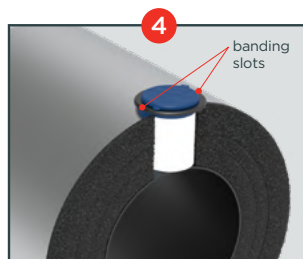
STEP 2

Apply a mastic cryo-bond vapor stop sealant on the outer circumference of the PTFE sleeve followed by insertion of PTFE sleeve in the cavity.



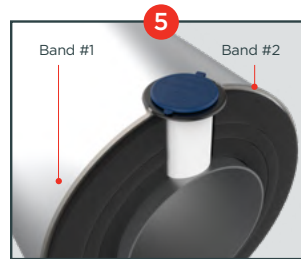
STEP 3

Insert the closed-cell foam containing the PTFE pull strap inside the PTFE sleeve.



STEP 4

Insert the plug and aluminum ring over the protruded portion of PTFE sleeve. During installation of plug, ensure that banding slots of aluminum ring are facing in the circumference (radial) direction of the pipe.



STEP 5

Loop each SS band through the underside of each banding slot located on both sides of the aluminum ring. Secure into place with banding clips.

Join the ends of both SS bands on the adjacent side and tightly secure into place with an additional banding clip.

Two stainless steel (SS) bands are required to secure the plug and aluminum ring in place.



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